

# NGUYEN Quang-Duy

0000-0002-3517-0945

(+33) 7 53 97 25 47

quang-duy.nguyen@cea.fr

<https://w3id.org/people/quang-duy.nguyen/>

"I may stutter in speaking, but not in philosophizing, inventing, and empathizing."



## Education

### 2017 – 2020 PhD in Computer Science

École Doctorale des Sciences Pour l'Ingénieur, University Clermont-Auvergne, France

UR TSCF, MathNUM département, INRAE (Irstea), Clermont-Ferrand, France

Funding : Scholarship from the region Auvergne-Rhône-Alpes and FEDER

PhD defense : 16/07/2020

### 2014 – 2015 Master 2 in Computer Networking

University Claude Bernard Lyon I, France

Funding : (1) Scholarship AUF-IFI; (2) Grant from IdEx of University of Strasbourg

Note : 15.31/20.00 - Rank : 1/60

### 2013 – 2014 Master 1 in Computer Science

Vietnam National University (VNU), Hanoi

Institut de la Francophonie pour l'Informatique (IFI), Hanoi, Vietnam

Funding : Scholarship AUF-IFI

Note : 14.20/20.00

### 2007 – 2012 Engineer of Information Technology in Computer Engineering

Hanoi University of Science and Technology, Vietnam

Note : 14.96/20.00

## Experience

### 12/2021 – present Postdoctoral Researcher → Researcher

LSEA laboratory, DILS department, CEA List, Palaiseau, France

Project : (1) LocalSEA; (2) CoGeFlux; (3) OTPaaS; (4) List Tech Days : F&3D DTs;

(5) APS : INTEROP; (6) TARGET-X : Ros6GBUSBridge; (7) RAASCEMAN

Keywords : Industry 4.0/5.0, AAS, Papyrus, Manufacturing, UR3e, AGV, ROS 1/2, DPP

### 10/2020 – 09/2021 Postdoctoral Researcher

LTCI laboratory, INFRES department, Télécom Paris, Palaiseau

Project : OPC UA PubSub for Caméléon

Keywords : IIoT, SNCF, OPC UA, Embedded System, Zephyr OS, Node-RED, C

### 01/2017 – 07/2020 PhD Student

UR TSCF, MathNUM département, INRAE

Project : (1) ConnecSens; (2) AgroTechnoPôle

Keywords : Agriculture, IoT, Ontology, Reasoning, OWL, SWRL, Java, Python

### 08/2016 – 10/2016 Research Engineer

Programmation, Networks and Systems team, LaBRI laboratory, Bordeaux, France

Project : Le Palais de la Mémoire

Keywords : Sounds, Method of Loci, Beacons, BLE, Android, Java

### 04/2015 – 07/2016 Master 2 Intern → Research Engineer

Networks team, ICube laboratory, Strasbourg, France

Project : FIT/IoT-lab

Keywords : Multihoming, Mobility, Contiki, TelosB, Python, C/C++

## Publications\*

- [CI.12] **Quang-Duy Nguyen**, and Saadia Dhouib, "*Lessons from Developing AAS Digital Twins for Factory Buildings with Papyrus4Manufacturing*", Proceedings of the 3rd IEEE Industrial Electronics Society Annual Online Conference (ONCON), Virtual, 12/2024
- [CI.11] **Quang-Duy Nguyen**, Yining Huang, Guéréguin Der Sylvestre Sidebe, and Saadia Dhouib, "*From Multiple Digital Twins to a Multi-Faceted Digital Twin : Towards an AAS-Based Approach*", Proceedings of the 29th International Conference on Emerging Technologies and Factory Automation (ETFA), Padova, Italy, 09/2024
- [CI.10] **Quang-Duy Nguyen**, Saadia Dhouib, Eric Lucet, Antoine Le Mortellec, and Fabien Baligand, "*Bridging the Gap between IT and OT with AAS Digital Twins and MDE Techniques : An Industrial Waste Management Case Study*", Proceedings of the 29th International Conference on Emerging Technologies and Factory Automation (ETFA), Padova, Italy, 09/2024
- [JI.4] **Quang-Duy Nguyen**, Yining Huang, François Keith, Christophe Leroy, Minh-Thuyen Thi, and Saadia Dhouib, "*Manufacturing 4.0 : Checking the Feasibility of a Work Cell Using Asset Administration Shell and Physics-Based Three-Dimensional Digital Twins*", MDPI Machines, 01/2024
- [JI.3] Fadwa Rekik, Saadia Dhouib, and **Quang-Duy Nguyen**, "*Bridging the Gap between SysML and OPC UA Information Models for Industry 4.0*", Journal of Object Technology, 07/2023
- [CI.9] **Quang-Duy Nguyen**, Saadia Dhouib, Yining Huang, and Patrick Bellot, "*An Approach to Bridge ROS 1 and ROS 2 Devices into an OPC UA-based Testbed for Industry 4.0*", Proceedings of the 1st IEEE Industrial Electronics Society Annual Online Conference (ONCON), Virtual, 12/2022
- [CI.8] **Quang-Duy Nguyen**, Saadia Dhouib, and Patrick Bellot, "*A Unified Method to Design Bridges for OPC UA PubSub Networks in the Industrial IoT*", Proceedings of the 27th IEEE International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD), Paris, France, 11/2022
- [CI.7] **Quang-Duy Nguyen**, Saadia Dhouib, Kunal Suri, and Fadwa Tmar, "*From Requirement Specification to OPC UA Information Model Design : A Product Assembly Line Monitoring Case Study*", Proceedings of the 20th IEEE International Conference on Industrial Informatics (INDIN), Perth, Australia, 07/2022
- [CI.6] **Quang-Duy Nguyen**, Patrick Bellot, and Pierre-Yves Petton, "*An OPC UA PubSub Implementation Approach for Memory-Constrained Sensor Devices*", Proceedings of the 31st IEEE International Symposium on Industrial Electronics (ISIE), Anchorage, United States, 06/2022
- [CI.5] **Quang-Duy Nguyen**, Fadwa Tmar, Yining Huang, and Saadia Dhouib, "*Early Lessons Learned from the Development of a Local OPC UA-based Robotic Testbed for Research*", Proceedings of the 31st IEEE International Symposium on Industrial Electronics (ISIE), Anchorage, United States, 06/2022
- [CI.4] **Quang-Duy Nguyen**, Saadia Dhouib, Jean-Pierre Chanet, and Patrick Bellot, "*Towards a Web-of-Things Approach for OPC UA Field Device Discovery in the Industrial IoT*", Proceedings of the 18th IEEE International Conference on Factory Communication Systems (WFCS), Pavia, Italy, 04/2022
- [CI.3] **Quang-Duy Nguyen**, Catherine Roussey, Patrick Bellot, and Jean-Pierre Chanet, "*Stack of Services for Context-Aware Systems : An Internet-Of-Things System Design Approach*", Proceedings of the 15th IEEE International Conference on Computing and Communication Technologies (RIVF), Hanoi, Vietnam, 08/2021
- [T.1] **Quang-Duy Nguyen**, "*Interoperability and Upgradability Improvement for Context-Aware Systems in Agriculture 4.0*", PhD thesis, University Clermont-Auvergne, France, 2020
- [JI.2] Julian Eduardo Plazas, Sandro Bimonte, Christophe de Vault, Michel Schneider, **Quang-Duy Nguyen**, Jean-Pierre Chanet, Hongling Shi, Kun Mean Hou, and Juan Carlos Corrales, "*A Conceptual Data Model and its Automatic Implementation for IoT-Based BI Applications : UML Profile and MDA Approach*", IEEE Internet of Things Journal, 10/2020

**Summary**  
 First-authored items : 15/19  
 Citations : 90  
 H-index : 6  
 I-index : 5  
 Items classified by domains :  
   IoT (8), OPC UA (7),  
   Ontology (5), AAS (4)  
 Items classified by SJR :  
   Q1 (1), Q2 (2),  
   Q3 (0), Q4 (1)  
 Scopus-indexed Items : 17  
 ISI-indexed Items : 11

[CF.2] **Quang-Duy Nguyen**, Catherine Roussey, Maria Poveda-Villalón, Christophe de Vault, Jean-Pierre Chanet, and Camille Noûs, "*CASO et IRRIG deux ontologies pour le développement de systèmes contextuels : cas d'usage sur l'automatisation de l'irrigation*", Actes des 31es journées francophones d'Ingénierie des Connaissances (IC), Angers, France, 07/2020

[JI.1] **Quang-Duy Nguyen**, Catherine Roussey, Maria Poveda-Villalón, Christophe de Vault, and Jean-Pierre Chanet, "*Development Experience of a Context-Aware System for Smart Irrigation using CASO and IRRIG ontologies*", Special Issue "Semantic Technologies Applied to Agriculture", MDPI Applied Sciences, 03/2020

[CI.2] Maria Poveda-Villalón, **Quang-Duy Nguyen**, Catherine Roussey, Christophe de Vault, and Jean-Pierre Chanet, "*Ontological Requirement Specification for Smart Irrigation Systems : A SOSA/SSN and SAREF Comparison*", Proceedings of the 9th International Semantic Sensor Networks Workshop (SSN) of the 17th International Semantic Web Conference (ISWC), Monterey, United States, 10/2018

[CF.1] Maria Poveda-Villalón, **Quang-Duy Nguyen**, Catherine Roussey, Christophe de Vault, and Jean-Pierre Chanet, "*Besoins ontologiques d'un système d'irrigation intelligent : Comparaison entre SSN et SAREF*", Actes des 29es journées francophones d'Ingénierie des Connaissances (IC), Nancy, France, 07/2018

[CI.1] **Quang-Duy Nguyen**, Julien Montavont, Nicolas Montavont, and Thomas Noël, "*RPL Border Router Redundancy in the Internet of Things*", Proceedings of the 15th International Conference on Ad-Hoc Networks and Wireless (ADHOC-NOW), Lille, France, 07/2016

## Research Skills

Project Management	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
System Implementation	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Scientific Writing	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Presentation	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

## Linguistic

Vietnamese	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
French	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
English	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Japanese	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

## Technical Skills

Standard	OPC UA, AAS, RAMI 4.0, ISA-95
IT Network	TCP/IP, UA PubSub, MQTT, REST
OT Network	Profinet, MODBUS, UA FX
Cybersecurity	AES-CTR, TLS, JWT
OS/Middleware	Linux, Zephyr, BaSyx, ROS2
Methodology	Mini-Waterfall, LOT, Agile, MDE
Vocabulary	SOSA/SSN, CASO, IRRIG
Tool	Papyrus, Protégé, Wireshark, UaExpert

## Programming

C	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Java	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
C++	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Python	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Shell script	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Node-Red/JS	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
SQL/SPARQL	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
SWRL/SHACL	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

## References

- **Dr. Saadia DHOUIB**, Senior researcher and project manager in LSEA, DILS department, CEA List  
Direct supervisor in DRT/LIST/DILS/LSEA  
✉ saadia.dhouib@cea.fr
- **Prof. Patrick BELLOT**, Director of the CCN team of LTCI, INFRES department, Télécom Paris  
Direct supervisor in the project "OPC UA PubSub for Caméléon"  
✉ patrick.bellot@telecom-paris.fr
- **Dr. Jean-Pierre CHANET**, Director of UR TSCF, MathNUM department, INRAE  
Director of the thesis "Interoperability and Upgradability Improvement for Context-Aware Systems in Agriculture 4.0"  
✉ jean-pierre.chanet@inrae.fr